

## CLAIMS

1. A method of screening a compound or its salt that changes the binding property of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, to a fatty acid or a salt thereof, which comprises using (1) the receptor protein, its partial peptide, or a salt thereof and (2) the fatty acid or a salt thereof.

2. A kit for screening a compound or its salt that changes the binding property of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, to a fatty acid or a salt thereof, comprising (1) the receptor protein, its partial peptide, or a salt thereof and (2) the fatty acid or a salt thereof.

3. A method of screening an agonist or an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, which comprises using (1) the receptor protein, its partial peptide, or a salt thereof and (2) a compound or its salt that changes the binding property of the receptor protein, or a salt thereof to a fatty acid or a salt thereof.

4. A kit for screening an agonist or an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, comprising (1) the receptor protein, its partial peptide, or a salt thereof and (2) a compound or its salt that changes the binding property of the receptor protein, or a salt thereof to a fatty acid or a salt thereof.

5. A pharmaceutical comprising a compound or its salt that changes the binding property of a fatty acid or a salt thereof to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

6. An agent for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction, comprising an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

7. An agent for regulating stress, comprising an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the

amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

8. An agent for suppressing adrenocorticotrophic hormone (ACTH) secretion, comprising an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

9. An agent for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, comprising an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

10. An agent for preventing/treating obesity, comprising an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

11. An agent for regulating stress, comprising an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

12. An agent for promoting adrenocorticotrophic hormone (ACTH) secretion, comprising an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

13. An agent for preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, comprising an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ

ID NO: 8, or a salt thereof.

14. A method of screening an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, which comprises assaying the intracellular  $\text{Ca}^{2+}$  level increasing activity, the intracellular cAMP production suppressing activity, MAP kinase phosphorylation or activation, the adrenocorticotrophic hormone (ACTH) secretion suppressing activity, the glycerol production suppressing activity or the lipolysis suppressing activity in the case where a test compound is contacted with cells containing a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

15. An agent for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction, comprising a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

16. An agent for regulating stress, comprising a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

17. An agent for suppressing adrenocorticotrophic hormone (ACTH) secretion, comprising a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

18. An agent for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, comprising a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

19. An agent for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

20. An agent for regulating stress, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

21. An agent for suppressing adrenocorticotrophic hormone (ACTH) secretion, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

22. An agent for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

23. A diagnostic agent for diabetes mellitus, impaired glucose tolerance, ketosis, acidosis, diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, hyperlipemia, arteriosclerosis, angina pectoris, myocardial infarction, sexual dysfunction, obesity, pituitary dysfunction, cancer, deficits in memory and learning, pancreatic exhaustion, hypoglycemia, insulin allergy, lipotoxicity, fatty atrophy, cancerous cachexia, hyperinsulinemia, hyperglycemia, disorder caused by high FFA flux, hypertriglyceridemia, fatty liver, dysfunction of heat production, cholelithiasis, eating disorder, secretion disorders of intestinal hormones or circulatory disease, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

24. A diagnostic agent for stress, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

25. A diagnostic agent for ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, chronic articular rheumatism, systemic lupus erythematosus,

polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, comprising a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

26. An agent for preventing/treating obesity, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

27. An agent for regulating stress, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

28. An agent for promoting adrenocorticotrophic hormone (ACTH) secretion, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

29. An agent for preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

30. A diagnostic agent for diabetes mellitus, impaired glucose tolerance, ketosis, acidosis, diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, hyperlipemia, arteriosclerosis, angina pectoris, myocardial infarction, sexual dysfunction, obesity, pituitary dysfunction, cancer, deficits in memory and learning, pancreatic exhaustion, hypoglycemia, insulin allergy, lipotoxicity, fatty atrophy, cancerous cachexia, hyperinsulinemia, hyperglycemia, disorder caused by high FFA flux, hypertriglyceridemia, fatty liver, dysfunction of heat production, cholelithiasis, eating disorder, secretion disorders of intestinal hormones or circulatory disease, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

31. A diagnostic agent for stress, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

32. A diagnostic agent for ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, comprising an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or its partial peptide, or a salt thereof.

33. An agent for preventing/treating obesity, comprising a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor

protein.

34. An agent for regulating stress, comprising a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein.

35. An agent for promoting adrenocorticotrophic hormone (ACTH) secretion, comprising a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein.

36. An agent for preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, comprising a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein.

37. An agent for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction, comprising a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

38. An agent for regulating stress, comprising a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

39. An agent for suppressing adrenocorticotrophic hormone (ACTH) secretion,

comprising a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

40. An agent for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, comprising a compound or its salt that increases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

41. An agent for preventing/treating obesity, comprising a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

42. An agent for regulating stress, comprising a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

43. An agent for promoting adrenocorticotrophic hormone (ACTH) secretion, comprising a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

44. An agent for preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, comprising a compound or its salt that decreases the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by



SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof.

45. An agent for potentiating the signal transducing activity of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, comprising a fatty acid or a salt thereof.

46. The agent according to claim 45, which is an agent for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction.

47. The agent according to claim 45, which is an agent for regulating stress.

48. The agent according to claim 45, which is an agent for suppressing adrenocorticotrophic hormone (ACTH) secretion.

49. The agent according to claim 45, which is an agent for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy.

50. The agent according to claim 45, which is an agent for suppressing adrenocorticotrophic hormone (ACTH) secretion.

51. A method of preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction, which comprises administering to a mammal an effective dose of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

52. A method of regulating stress, which comprises administering to a mammal an effective dose of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the

same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

53. A method of suppressing adrenocorticotrophic hormone (ACTH) secretion, which comprises administering to a mammal an effective dose of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

54. A method of preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, which comprises administering to a mammal an effective dose of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

55. A method of preventing/treating obesity, which comprises administering to a mammal an effective dose of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid

sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

56. A method of regulating stress, which comprises administering to a mammal an effective dose of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

57. A method of promoting adrenocorticotrophic hormone (ACTH) secretion, which comprises administering to a mammal an effective dose of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

58. A method of preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, which comprises administering to a mammal an effective dose of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented

by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof.

59. Use of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction.

60. Use of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for regulating stress.

61. Use of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial

peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8 to produce an agent for suppressing adrenocorticotrophic hormone (ACTH) secretion.

62. Use of (i) a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, or (iii) an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy.

63. Use of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for preventing/treating obesity.

64. Use of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein, or (iii) an antagonist to a G protein-coupled receptor protein

comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for regulating stress.

65. Use of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for promoting adrenocorticotrophic hormone (ACTH) secretion.

66. Use of (i) an antibody to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, its partial peptide, or a salt thereof, (ii) a polynucleotide comprising the entire or part of a base sequence complementary to a polynucleotide comprising a polynucleotide encoding a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide of the receptor protein, or (iii) an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, to produce an agent for preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock.

67. A method for confirming that (i) a drug for preventing/treating diabetes mellitus, impaired glucose tolerance, ketosis, acidosis, diabetic neuropathy, diabetic nephropathy,

diabetic retinopathy, hyperlipemia, arteriosclerosis, angina pectoris, myocardial infarction, sexual dysfunction, obesity, pituitary dysfunction, cancer, deficits in memory and learning, pancreatic exhaustion, hypoglycemia, insulin allergy, lipotoxicity, fatty atrophy, cancerous cachexia, hyperinsulinemia, hyperglycemia, disorder caused by high FFA flux, hypertriglyceridemia, fatty liver, dysfunction of heat production, cholelithiasis, eating disorder, secretion disorders of intestinal hormones or circulatory diseases, (ii) a drug for regulating stress, (iii) a drug for regulating adrenocorticotrophic hormone (ACTH) secretion, (iv) a drug for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, or (v) chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, binds to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, which comprises using the receptor protein or a salt thereof.

68. A method for confirmation that a drug for preventing/treating (i) a drug for preventing/treating diabetes mellitus, hyperlipemia, arteriosclerosis, angina pectoris or myocardial infarction, (ii) a drug for regulating stress, (iii) a drug for suppressing adrenocorticotrophic hormone (ACTH) secretion, or (iv) a drug for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, is an agonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, which comprises using the receptor protein or a salt thereof.

69. A method for confirmation that (i) a drug for preventing/treating obesity, (ii) a drug for regulating stress, (iii) a drug for promoting adrenocorticotrophic hormone (ACTH)

secretion, or (iv) a drug for preventing/treating chronic articular rheumatism, systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock, is an antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a salt thereof, which comprises using the receptor protein or a salt thereof.

70. The method for confirmation according to claims 67 through 69, wherein the binding amount of each drug to the receptor protein, its partial peptide or a salt thereof is determined when each drug is contacted with the receptor protein, its partial peptide or a salt thereof.

71. A pharmaceutical comprising the combination of (1) (i) an agonist or antagonist to a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or/and (ii) a compound or its salt that changes the expression level of a G protein-coupled receptor protein comprising the same or substantially the same amino acid sequence as the amino acid sequence represented by SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 8, or a partial peptide thereof, and (2) (i) a drug for preventing/treating diabetes mellitus, impaired glucose tolerance, ketosis, acidosis, diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, hyperlipemia, arteriosclerosis, angina pectoris, myocardial infarction, sexual dysfunction, obesity, pituitary dysfunction, cancer, deficits in memory and learning, pancreatic exhaustion, hypoglycemia, insulin allergy, lipotoxicity, fatty atrophy, cancerous cachexia, hyperinsulinemia, hyperglycemia, disorder caused by high FFA flux, hypertriglyceridemia, fatty liver, dysfunction of heat production, cholelithiasis, eating disorder, secretion disorders of intestinal hormones or circulatory diseases, (ii) a drug for regulating stress, (iii) a drug for regulating adrenocorticotrophic hormone (ACTH) secretion, (iv) a drug for preventing/treating ACTH-producing tumor, Cushing's disease, infectious disease, secondary adrenocortical insufficiency, peptic ulcer, diabetes mellitus, mental disorder, cataract, glaucoma, tuberculous disease, hypertension, Cushing's syndrome or adrenocortical atrophy, or (v) a drug for preventing/treating chronic articular rheumatism,



systemic lupus erythematosus, polymyositis, rheumatic fever, scleroderma, kidney disease, bronchial asthma, pulmonary tuberculous pleuritis, sarcoidosis, diffuse interstitial pneumonia, ulcerative colitis, cholestatic acute hepatitis, fulminant hepatitis, chronic hepatitis, cirrhosis, encephalomyelitis, peripheral neuritis, multiple sclerosis, myasthenia gravis, facial paralysis, hemolytic anemia, granulocytosis, purpura, aplastic anemia, leukemia, malignant lymphoma, acute or chronic adrenocortical insufficiency, adrenogenital syndrome, malignant exophthalmos due to thyroid gland disease, ACTH isolated deficiency, urticaria, eczema, dermatitis, herpes zoster, psoriasis, drug allergy or anaphylactic shock.

72. A G protein-coupled receptor protein consisting of the amino acid sequence represented by SEQ ID NO: 8, its partial peptide or a salt thereof.

73. A polynucleotide comprising a polynucleotide encoding the G protein-coupled receptor protein according to claim 72.

74. A DNA consisting of the base sequence represented by SEQ ID NO: 9.

75. A recombinant vector comprising the polynucleotide according to claim 73.

76. A transformant transformed by the recombinant vector according to claim 75.

77. A method of producing the G protein-coupled receptor protein or a salt thereof according to claim 72, which comprises culturing the transformant according to claim 76 and producing the G protein-coupled receptor protein or a salt thereof according to claim 72.